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the mountain slopes rising from partially cultivated rocky pastures near the river. A belt of woodland occupies the valley slopes up to an altitude of about 3600 feet, the montane forest consisting of *Betula odorata*, reaching a maximum height of 20 feet, with an undergrowth of *Betula nana*, *Juniperus nana*, *Empetrum nigrum*, and various species of *Salix* and *Vaccinium*, together with a rather abundant herbaceous vegetation. The shrubby members of this association persist in the belt of alpine shrubland, which reaches a poorly defined upper limit (4500–4800 ft.) with the disappearance of its most persistent members, *Salix reticulata* and *Betula nana*. Above is a luxuriant alpine lichen association, affording pasture for the reindeer and dotted with a variety of alpine flowers. Among the notes upon the many species examined, the scarcity of *Sphagnum* even in bogs is emphasized, and the results of a study of the variation at different altitudes of the leaves of *Betula nana*, both in size and structure, are recorded.—GEO. D. FULLER.

Parthenogenesis in Bennettites.—In 1894 LIGNIER published an account of the structure and affinities of *Bennettites Morieri*, and now, upon looking over his former preparations, he has come to the conclusion that the species was parthenogenetic.[20] The evidence is that the nucellar beak is not perforated or disorganized in any way, but is an absolutely continuous mass of primary tissue, that is, not tissue arising by proliferation and filling a passageway. The pollen chamber forms within the beak and extends more or less toward its tip, but never reaches the surface, so far as the author's preparations show. This is taken to prove that the observed embryos have developed in the absence of pollen tubes; it is recognized that they may or may not be parthenogenetic in the sense of arising from an unfertilized egg. It is further suggested that the parthenogenetic habit may have been the chief cause of the rapid disappearance of a group that was so flourishing during the Jurassic.—J. M. C.

Permeability.—CZAPEK[21] has brought together all his work on the effect of the surface tension of the surrounding fluid on the permeability of the Plasmahaut of the plant cell. Reviews[22] of preliminary articles have given the main points of this paper. Some evidence is offered that acids have their effect by interfering with the Plasmahaut emulsion. CZAPEK also doubts TRAUBE's conception of osmosis, though his experiments offer little evidence against it. Many more substances were found which produced exosmosis of the cell contents of phanerogams only when their aqueous solutions had a surface tension of 0.68 (or less) of that of water. The Plasmahaut of yeast apparently has a surface tension of about 0.60. The article seems to clear away much of the haze that has surrounded the matter of the significance of surface tension in cell activity.—WILLIAM CROCKER.

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[20] LIGNIER, O., Le *Bennettites Morieri* (Sap. et Mar.) Lignier se reproduisait probablement par parthénogénèse. Bull. Soc. Bot. France **58**:224–227. 1911.

[21] CZAPEK, F., Ueber eine Methode zur Bestimmung der Oberflächenspannung der Plasmahaut von Pflanzenzellen. 8vo. pp. iv+86. *figs. 3.* Jena: Gustav Fischer. 1911. M. 2.60.

[22] BOT. GAZ. **50**:234. 1910, and **51**:472. 1911.

Underground organs of weeds.—Conflicting statements by various authors have induced PAMMEL and FOGEL[23] to investigate the organs of vegetative reproduction of some of our most common weeds. The Canada thistle (*Cirsium arvense*), the horse nettle (*Solanum carolinense*), the milkweed (*Asclepias syriaca*), and the bindweed (*Convolvulus arvensis*), were all found to be propagated by horizontal roots bearing adventitious buds; while in the wild morning glory (*Convolvulus Sepium*) and the quack grass (*Agropyron repens*), the organs of vegetative multiplication are rootstocks. In some instances the roots and subterranean stems resembled each other so closely that only by microscopic examination could the difference be detected.—GEO. D. FULLER.

Epidermis and light refraction.—FRIMMEL[24] thinks he has shown that the lower papillate epidermis of the leaves of the yew gives a total refraction of the light passing through the leaf from above, thereby leading to the use of all light that enters the leaf. He relates this character to the ability of the tree to grow in shaded habitats. He believes the lower epidermis of a number of other conifers acts in the same way. He finds a similar contrivance in the spongy parenchyma of the cotyledon of the beech. The fact of total refraction in the yew seems entirely established; whether it is of biological significance or not is quite another question.—WILLIAM CROCKER.

Arctic vegetation.—Hare Island off the coast of West Greenland, an uninhabited island 66 square miles in area, has been visited several times by PORSILD,[25] who has found a flora consisting of 82 arctic and 30 subarctic species. The vegetation belongs to the fell-field formation, large areas quite devoid of plants, passing into a poorly developed heath with arctic meadows and bogs in the more sheltered situations. Dispersal is almost entirely through the agency of the wind over the surface of the snow and frozen seas. The subarctic species are regarded as relics of milder climate in post-glacial times.—GEO. D. FULLER.

Pneumatophores.—From an examination of the tissues of vertical apogeotropic branches of the roots of *Terminalia Arjuna*, a large tree of Central India,

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[23] PAMMEL, L. H., and FOGEL, ESTELLE D., The underground organs of a few weeds. Proc. Iowa Acad. Sci. **16**:pp. 7. *pls. 5.* 1909.

[24] FRIMMEL, FRANZ V., Die untere Kutikula des *Taxus*-Blattes ein Lichtreflektor Oester. Bot. Zeitsch. **61**:216–223. *figs. 4.* 1911.

[25] PORSILD, MORTEM P., The plant life of Hare Island off the coast of West Greenland. Saertryk af Meddelelser om Gronland **47**:252–274. *figs. 10.* Kobenhavn: Bianco Lunos. 1910.